

QUARTERLY PROGRESS REPORT
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January 2001 - March 2001

Marshall Space Flight Center
Safety and Mission Assurance Mission Services Contract
NAS8-00179

Approved:

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April 13, 2001

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1.0 INTRODUCTION

Hernandez Engineering, Inc. (HEI) successfully performed all required activities and tasks, as described in this report, in fulfillment of their Safety and Mission Assurance (S&MA) Mission Services Contract (NAS8-00179) with NASA's Marshall Space Flight Center (MSFC). This report covers a three-month period of the contract's second quarter of the first year: January, 2001 through March, 2001.

2.0 GENERAL MANAGEMENT

2.1 Data Requirements

The second quarter of the S&MA Mission Services contract was successfully completed on March 30, 2001. All Data Requirements (DR) Documents were submitted on or ahead of schedule throughout the quarter. They included DRD 875CD-001 On-Site Employee Location Listing; DRD 875MA-002 Financial Management Reports; DRD 875MA-003 Progress Reports (Monthly/Quarterly); DRD 875MA-006 Operations Plan, Problem Assessment Center (PAC); DRD 875MA-007 Quarterly Open Problems List; DRD 875MA-008 Monthly Newly Opened/Closed Problem Summary; DRD 875SA-002 Mishap and Safety Statistics Reports.

2.2 Personnel Status

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3.0 BUSINESS MANAGEMENT

We have experienced no financial or business management problems during this period. We attribute this to close attention to details, effective use of established controls designed to efficiently respond to program changes---both anticipated and unexpected---and the continuing support of our corporate financial group's dedicated efforts at controlling overhead expenses.

The contract continues to have a total cost underrun at the end of this period---see the March 2001 Monthly Financial Report, DRD 875MA-002, for specifics. Attachment 2, Man-Hours Expended, of this report contains a description, by major task, of the total man-hours expended this period.

(b)(4)

4.0 PERFORMANCE OF WORK AND USE OF FACILITIES AND EQUIPMENT

4.1 Safety

4.1.1 Industrial Safety (IS)

The Industrial Safety (IS) group initiated the CY01 annual facility inspection cycle, performed 142 OSHA compliance facility inspections and provided all required reports in a timely manner, meeting the schedule provided by QS30. Approximately 379 MSFC facilities are scheduled for inspection during CY01. Of these 379 facilities, 77 have been identified as facilities where there is an increase risk of accident, injury or illness due to the nature of the work being performed, which can be defined as Hazardous Operations. In accordance with OSHA 29 CFR 1960.25, these facilities will be inspected semi-annually. In coordination with QS30, IS initiated a change to the OSHA Facilities Safety Inspection Process. Effective March 1, 2001, S&MA transmits inspection findings reports electronically to Building Managers instead of by a NASA Letterhead hard copy. This change will save numerous man-hours and letter paper. To date customer feedback has been very favorable. IS also performed 293 construction site compliance inspections to monitor adherence to OSHA and MSFC safety standards.

Among other activities, IS: (1) updated seven facility fire evacuation plans; (2) participated in eight pre-construction conferences; (3) performed eight final safety inspections of facilities under renovation or construction; (4) reviewed 102 sets of facility design drawings for compliance with OSHA and consensus codes; (5) participated in one training class to Area Managers and their assistants; and, (6) performed one annual fire drill, completing the annual requirement.

All facility safety violations were documented in the HAZTRAK databases in order to assure MSFC's compliance with OSHA, NASA, and other consensus code requirements. A system was established to document Unsafe Acts identified during annual or non-annual inspections. Using the established information fields of the HAZTRAK database, the database was modified to provide a separate line on the MSFC Facility Safety Inspection Report to document the Unsafe Act. As part of the inspection report, the Unsafe Act(s) are distributed to the building manager for corrective action.

As a major significant effort, IS continued to provide extensive support to the planning and review activities associated with the planned new Propulsion Research Laboratory (PRL). Support included: 1) Participation in the weekly meetings, 2) review of requirements for a Facility Safety Management Plan (FSMP) to establish a Facility Risk Indicator for the PRL, and 3) performed numerous safety assessments and facility inspections of current hazardous operations scheduled to be relocated in the PRL.

IS initiated, completed, or followed up on more than 13 facility safety assessments. Examples include: (1) as a short turn around task, performed an Operational Hazard Analysis (OHA) for the ISS S5 Truss Structural Test Article (STA). The OHA was performed in coordination with Flight Center Transportation, Security, EG&G, JSC Flight Crew personnel, and DCM operations in preparation for a dual crane critical transportation-load lift at MSFC; (2) reviewed the test of

the spring separation system for the X-38 De-orbit Propulsion Electrical Interface Panel prior to testing in building 4619; (3) followed-up on safety assessments for laboratories in buildings 4549, 4566, 4655 in support of the PRL, and 4) performed numerous explosives siting problem quantity-distance calculations for the Zero-Boiloff testing at Test Stand 4699.

As a significant strength, IS provided dedicated, full-time safety and quality support to the 48" MNASA Motor test firing. Support included safety and quality surveillance for: (1) the installation of the motor case into the test stand, (2) pick-up and delivery of the propellant cartridges, (3) inspection, repair and installation of the propellant cartridges, (4) final assembly and test coverage, (5) post-test disassembly, and (6) preparation of propellant cartridge containers for shipment. In further support of the MNASA Motor, IS performed a quick turn around OHA for the dual crane critical lift at building 4650 required for de-staking.

IS continued to support the implementation of the NASA lifting standard, NSS 1740.9 by providing day-to-day advice and assistance to S&MA customers. In addition to performing numerous OHA's, IS: (1) served as the MSFC safety monitor on all ISS Transportation and Handling Operations; (2) developed and provided to NASA draft standards for Jacks and Forklifts to be included in the next revision of the NASA safety standard for lifting devices and equipment; (3) prepared quick turn around deviations on two, 5-Ton under hung hoists located in Building 4619 needed to support ISS "Critical Lift" operations; and (4) administered hands-on proficiency examinations to 13 overhead-crane operators in support of the MSFC Personnel Certification Program.

4.1.2 System Safety Engineering (SSE)

Space Shuttle Activities. During this quarter, the System Safety Engineering (SSE) group reviewed 111 Class I change proposals for safety impact and reviewed the KSC daily problem report list each day for potential Shuttle element safety impacts. SSE supported three System Safety Review Panel (SSRP) Telecons. SSE also supported the launch preparations for STS-98, STS-102 and STS-100, including assessment of potential safety issues, participation in problem resolution, milestone discussions and STS-98 and STS-102 HOSC launch support. SSE has continued supporting pyrotechnic device procurement and flight certification. SSE has also provided safety assessments for 18 shuttle issues related to out of family conditions and first flight hardware changes.

HEI SSE supported the SRB project in the investigation of a problem identified during STS-97 postflight inspection. It was discovered that the left hand SRB Lower Strut System A, NASA Standard Initiator (NSI) Pressure Cartridge did not fire. The investigation showed the failure was the result of a cable failure. To determine the root cause, SSE traveled to the cable manufacture's facility and spent a week evaluating procedures. It was finally decided to roll STS-98 back to the VAB for further evaluation. SSE also supported an IEA ATP failure investigation during the period.

Upgrades. HEI SSE and QA have been providing support to the Solid Rocket Booster Upgrades program by participating in reviews and teleconferences for the Helium Auxilliary Power Unit (APU) Systems Requirement Review/System Definition review (SRR/SDR). This means safety

impacts will be identified early in the design process and S&MA can have substantial and meaningful input to the hardware design.

SAPHIRE Software Recommendations. SSE evaluated and made several recommendations for changes to the SAPHIRE software currently being adopted to develop the Space Shuttle Probabilistic Risk Assessment. The current fault tree graphics engine of SAPHIRE is very cumbersome. The software developer was consulted and agreed that the changes would improve the software capabilities.

Space Transportation Directorate (STD) Requirements Working Group Meeting. SSE supported the working group established to define S&MA requirements for future STD programs to ensure timely incorporation of those requirements in the early phases of program development. This will ensure a better understanding of the scope of S&MA requirements for both project development and contractor teams.

4.1.3 Payload Safety

Payload Safety completed/updated 4 safety data packages (SDP). The Protein Crystal Growth-Single Thermal Enclosure System (PCG-STES) 6A Reflight SDP and the Laboratory Support Equipment (LSE) Digital Thermometer SDP was submitted to Johnson Space Center (JSC). The Microgravity Science Research Rack (MSRR-1) Experiment Carrier (EC) Phase II Flight and Phase 0/1 Ground SDP's were submitted to the Critical Design Review (CDR). In addition, Preliminary Hazard Analysis (PHA) was initiated for Interpropellant Seal (IPS) X-34 MC-1, Transient Interfacial Phenomena in Miscible Polymeric Systems (TIPSMPS), and Solar B. Payload Safety initiated a ground SDP for Node 2. In addition to SDP development, Payload Safety continued development of 4 SDP's and reviewed/submitted comments for 1 SDP's. Payload Safety also generated a Fault Tree Analysis for Pore Formation and Mobility Investigation/Solidification Using a Baffle in a Sealed Ampoule (PFMI/SUBSA) and Bridgeman Unidirectional Dendrites in Liquid Experiment (BUNDLE).

Payload safety supported the Window Observable Research Facility (WORF) and Coarsening in Solid Liquid Mixtures (CSLM) Flight Safety Review Panels (SRPs). Payload safety presented the PFMI/SUBSA Phase II hazard reports to the SRP and 7/7 were approved. Payload safety continues completion of the Propulsive small Expendable Deployer Systems (ProSEDS) Missile System Prelaunch Safety Package(MSPSP). Payload safety supported the SRP Special topics telecon for Flight 7A. Payload safety participated in the Requirement Data Review (RDR) dry run for BUNDLE and Comparison of Structure and Segregation in Alloys Directional Solidified in Terrestrial and Microgravity Environments (CSS). Payload safety participated in the Critical Design Review (CDR) for Observable protein Crystal Growth Apparatus (OPCGA) and MSRR-1 EC. Payload safety supported the System Requirements Review (SRR) for Gamma-ray Large Area Space Telescope (GLAST) Burst Monitor, the Software Requirements Review (SRR) for PFMI/SUBSA, and the Design Review #2 for Node 2. In addition, payload safety participated in the Interim Design Review (IDR) for the Delta-L. Payload safety provided Independent Assessment for the following reviews: MSRR-1 EC, PFMI/SUBSA SRR, and Delta-L IDR.

Payload Safety participated in the following technical meetings: Oxygen Generation Assembly (OGA) schematic review at Hamilton Sundstrand, Mechanics of Granular Materials (MGM) pre-ship review, and the Nodes Quarterly Review. In addition, Payload safety provided support at JSC during the Flight 5A.1 mission and a simulation for Flight 6A.

4.2 Reliability

4.2.1 Reliability & Maintainability (R&M) Engineering

During this reporting period, significant R&M activities included preparation and briefing at the STS-100 PAR of a one pager on the first time flight of the Communication Band Controller that is located in the forward skirt of the SRB, and review and assessment of ECPs 3884 (annual update to SRB FMEA/CIL) and 3928 (single mission fuel isolation valve). R&M actively participated as a member of the SRB Integrated Electronics Assembly (IEA) Supportability Assessment Team (ISAT). The ISAT was chartered to assess the capability of the current IEA inventory to support the planned Shuttle flight rate through the year 2020. R&M support included review of IEA failure history, statistical analysis and trending of failure data, and development of an IEA supportability model. Also, R&M continued to review and support the Friction Stir Weld process as it transitions from the PDR (Sept. 2000) to CDR (Scheduled June 2001), and participated in the 90% Design Review for the Friction Stir Weld Tool.

R&M updated and released the ISS Node 2 Failure Modes and Effects Analysis/Critical Items List (FMEA/CIL) in support of the Node 2 DR2 milestone review. The updated FMEA reflected several design changes since the previous release, as well as numerous comments provided by Alenia. Considerable effort was spent coordinating and resolving the Alenia comments in a timely manner in order to support Alenia's completion of the Fault Detection, Isolation, and Recovery (FDIR) analysis for the DR2. Additionally, R&M participated as a member of the S&MA review team for the Node 2 DR2. In this role, R&M was the primary reviewer of all reliability and maintainability documentation included in the DR2 data package, as well as related analyses such as the Logistics Support Analysis, FDIR Analysis, and Operational Sequence Diagrams. R&M also provided support to the S&MA team lead for review, coordination, screening, and dispositioning of all R&M-related Review Item Discrepancies generated during the review process.

In support of Node 3 Environmental Control and Life Support System (ECLSS) development, R&M worked with S&MA and ECLSS project personnel to re-prioritize the remaining work for completion of the ECLSS FMEA/CIL in light of ECLSS schedule changes.

In support of the MSRR-1 Equipment Carrier (EC) CDR, R&M completed and released the MSRR-1EC FMEA/CIL, Reliability Analysis, Maintainability Analysis, and Limited Life Items List. These analyses were coordinated with S&MA and MSRR-1 design counterparts. Additionally, the R&M Manager served as the independent Reliability and Maintainability reviewer for the MSRR-1 CDR. Also in support of the MSRR-1 team, R&M prepared a Fault Tree Analysis for the Quench Module Insert (QMI) Phase Change Device (PCD) Thermal Interface Collar (TIC) failure during on-orbit operations. R&M was tasked to develop a fault tree that considers all possible causes leading to PCD/TIC failure during operations and

identifies the controls that are in place to mitigate the risk associated with the various failure causes. Additionally, R&M assessed the revised QMI quench mechanism design to determine impact to the overall reliability of QMI. R&M calculated the failure rate for the new motor controller being used for the quench mechanism and rolled it into the overall failure rate for QMI. It was concluded that the new motor controller design improves the QMI reliability compared to the previous capture mechanism design.

In support of the X-38 Deorbit Propulsion System (DPS) design development, R&M completed and released a preliminary FMEA/CIL for the MSFC-developed DPS Electrical Interface Panel (EIP). Development of the EIP FMEA/CIL required close interaction with in-house MSFC design engineers to identify and document rationale for retention for EIP critical items. R&M is currently finalizing the preliminary FMEA/CIL for the DPS Bolt Retention System (BRS). HEI also continued development of fault trees for critical events related to separation of the DPS.

R&M began development of a FMEA/CIL for the Solar-B X-Ray Telescope and Extreme Ultraviolet Imaging Spectrometer science instruments. An initial draft of the analysis was completed and delivered to the Solar-B project office. R&M will continue to work with the project office in order to flesh out and expand the analysis as additional information is made available.

In support of the Interim Control Module (ICM) program shutdown, R&M began updating the ICM FMEA to address concerns related to the use of metal can relays, as well as several design changes since the previous FMEA submittal.

In support of the X-34 MC-1 engine design development, R&M continued development of the MC-1 FMEA/CIL up until the point that the X-34 program was terminated. R&M then supported program shutdown activities.

R&M continues to play an integral role in the Space Shuttle Probabilistic Risk Assessment (PRA) project. During this reporting period, R&M worked with JSC Safety, Reliability, and Quality Assurance to update the Space Shuttle vehicle-level ascent risk to reflect proposed Shuttle hardware upgrades, using the Quantitative Risk Assessment System (QRAS) results as the baseline. R&M provided results identifying the risk reductions associated with each of the various Shuttle hardware upgrades. Additionally, significant effort was expended planning, coordinating, and implementing the transition of the PRA modeling methodology from QRAS to SAPHIRE (Systems Analysis Programs for Hands-On Integrated Reliability Evaluations). This effort included on-going interface with Code Q, JSC, KSC, NASA HQ and MSFC Prime Contractors, as well as travel to each of the Prime Contractors. R&M played an integral role in the direction of this new modeling technique and produced preliminary schedules and detail of the PRA models to be developed which have gotten the attention of the Shuttle Program Office and JSC PRA team. The new models will enhanced inter-element dependencies previously not analyzed in depth, and improve overall model integration between propulsion (MSFC), Orbiter (JSC) and ground processing (KSC). Furthermore, the new models R&M have developed are modular and satisfy MSFC S&MA and Project Office's needs for evaluating upgrade issues. The model is also adaptive so that more complicated processing & human error models, and complex time-dependent failure probabilities can be incorporated. In order to support the transition from

QRAS to SAPHIRE, several R&M PRA personnel participated in a 4-day training course on use of the SAPHIRE software.

4.2.2 Problem Assessment Center (PAC) Operations

HEI's PAC personnel processed and coordinated disposition of problem reports, supported launch preparation milestones, coordinated the MSFC Problem Assessment System, and operated the Corrective Action System (CAS). The PAC received and entered 31 new problem reports (PRs) into MSFC's Problem Reporting and Corrective Action (PRACA) System, coordinated MSFC interim closure of 42 PRs, received 27 prime contractor closure recommendations, supported MSFC full closure of 22 PRs, coordinated non-problem closure of 5 problems, and performed 268 individual PR database updates and reviews. We conducted 8 SSME problem review boards, which dispositioned 20 of 22 problem reports presented. The SSME PAC generated or updated trends for all problems submitted for disposition and SRB PAC generated trends for all newly opened problems.

The PAC supported 22 pre-launch milestones for STS-98, -102, and -100 in addition to coverage of 2 successful Level A launch attempts (STS-98 and -102) and the contingency simulation conducted in association with the STS-102 FRR. This included providing open problems listing and counts, real-time meeting support, and/or issue analysis on open MSFC PRACA critical problems. In support for the launch attempts, we extracted and provided copies of KSC PRACA problems as they were entered at KSC for MSFC S&MA review during Level A countdown, and instructed the HOSC on use of the KSC PRACA system. We also drafted, obtained S&MA review, and implemented ground-rules for PAC's launch support.

In problem system coordination, the PAC participated in S&MA's close-out of MC-1 processing; planned, organized, and conducted a 2-day, 37-chart training course on MSFC PRACA and Shuttle PRACA requirements for HEI and shuttle prime contractors to satisfy a PRACA Evaluation Team action against MSFC, and reviewed and approved 7 user accounts for MSFC UNIX PRACA. The PAC also expedited MSFC review and disposition of 4 SRB prior to the launch of STS-98. We also coordinated MSFC review and revision of wording of the electronic CIL change request and provided input to MSFC's review of the PRACA codes revision change request. We also reviewed and discussed with the RSRM prime contractor proposed revisions to their problem reporting process. Also, the PAC and IM groups worked together to correct and upgrade certain MSFC PRACA database features, including document references, data labels, additional sorts, and elimination of inactive projects.

The PAC provided at least 5 different sets of problem data in support of SRB's IEA Supportability Assessment Team, SRB cable problem histories, SSME data regarding HPFTP housing inner ring cracks in the early 1990s, and various other smaller ad hoc data sets from MSFC PRACA. These were in addition to regular monthly reporting of newly opened/newly closed MSFC PRACA problems and new opened shuttle element PRACA problems for presentation to the Human Exploration and Development of Space, a quarterly update of the In-Flight Anomaly (IFA) Center metric, quarterly generation of the Open Problems List, daily distribution of KSC Shuttle PRACA problems and the report from MSFC's resident office at KSC, daily maintenance of the Open Against Next Mission problem summary available on the web, and generation of various ad hoc reports on problem system activity. We also

supported a Level 2 PRACA data integrity study by reviewing the accuracy and adequacy of information on 168 MSFC PRACA problems.

In implementation and operation of the MSFC CAS, we received 8 potential CAS reports, screened 7 draft Recurrence Control Action Requests (RCARs), and initiated 1 RCAR. We received 9 responses from laboratory points of contact with either disposition rationale or response extension requests. We coordinated Corrective Action Board review of 9 RCARs, resulting in full closure of 7 RCARs. We also provided open RCAR status reports and discussion at the ISO Implementation Team and Focus Team meetings, issued monthly RCAR status and delinquent response reports, and defined, generated, and presented monthly metric charts of RCAR activities and statuses at the ISO Implementation Team. We participated in the NQA surveillance audit and the internal S&MA audits, obtaining close-out of 2 findings from the previous NQA audit and with no new findings generated against CAS or MSFC PRACA activities. We continued with review and upgrade of various ISO documents, including submitting 2 document revisions to DCB review, getting the "Corrective Action System" approved by the DCB, leading a team considering upgrade of "Preventive Action", and participating on the "Customer Focus" team.

4.2.3 ALERT Program

HEI's ALERT support included both regular and special activities as we coordinated MSFC ALERT processing. HEI received 28 ALERT notifications, distributed all 28 ALERT announcements for MSFC review, and obtained 194 responses from MSFC project, contractor, and laboratory contacts. We completed checkout and implementation of the new MSFC ALERT Notification, Response, and Status web-based data system and worked with users to define contacts and provide training to individuals and small groups on its use. We coordinated MSFC response to 2 NASA HQ Inspector General ALERTs, and assisted in generation of MSFC Safe ALERTs on SAITEX sander belts and Silicon Graphics Inc. ONYX off-line switch power supplies at the direction of the Center Director. We also reviewed and justified rejection of proposed changes to the standard data requirement for ALERT reporting.

4.3 Quality

SSME/AT hardware and software Quality Engineering continued to provide support in closing out all open work prior to the Block II DCR, working to coordinate contractor comments and concerns on open Verification Complete Reports. QE also represented S&MA at the acceptance review for Engine 2051 which was the first Block II Engine delivered to the flight program and for 5 component/hardware acceptance reviews

HEI QE provided S&MA support at two PARS, Project Flight Readiness Reviews, and Preflight Acceptance Reviews, preparing one-page summaries when appropriate.

SRB QE participated on the Booster Separation Motor (BSM) Cracked Insert Anomaly/Problem Resolution Team, which required travel to Southern Research Institute in Birmingham, AL. In addition, Quality Engineering participated in a SRB BSM Phase III review held at Chemical Systems Division (San Jose, CA), and in a Special Process Audit at Primex Corporation in Redmond, WA.

ET Quality Engineering participated in the development of Government Mandatory Inspection Points for input into the ET Shuttle Observation Camera Manufacturing Process Plans. Quality Engineering also continued participation in qualification activities associated with composite materials and reformulation of ET foams. This included team participation in the composite intertank access door repair plan meetings. In addition, ET quality engineering prepared one one-page summary.

Quality Engineering participated in the development of a electronic database for the MC-1 Project Discrepancy Reports. QE supported the MC-1 project MRB in the dispositions of Thiokol Discrepancy Reports. QE also reviewed the X-34 & MC-1 Engine Projects Configuration Management Plan, participated in a review of MC-1 valve problems at the Honeywell Tempe, Arizona plant, and supported the MC-1 engine project in shutdown and project termination activities.

Quality Engineering personnel performed follow-up and closure of the generic non-conformance report generated by MSFC as a result of the third surveillance audit by National Quality Assurance, USA. QE participated in the first triennial audit of MSFC as an escort and as an auditee, and prepared the MSFC corrective action response for the one finding that was issued. QE also provided support to the internal audit program. QE revised MPG 1280.1, "Management Review," and participated in Directives Control Board (DCB) reviews and resolution of comments for other Directives revised during this period. QE provided consulting support to various Organizations across the Center on implementation of the expanded scope and the ISO 9001:2000 revision. QE provided training to new HEI employees on ISO 9001.

HEI Quality Assurance personnel performed receiving inspection and witnessed testing for PCG, STES, PCAM, VCD, ProSEDS, UPA, MSRR, X-37, SUBSA, MGM, and MPES.

Payloads Quality Engineering provided support to Stanford University (SU) in Palo Alto, CA during Post-Acoustic Testing for the Gravity Probe B Program. This support consisted of review of test procedures, review of hardware processing procedures, verification of Mandatory Inspection Points, witnessing of tests, and support of daily program status and schedule meetings. QE also conducted informal periodic audits of completed procedures for compliance to internal SU requirements. Observations were reviewed with the SU Systems Effectiveness Manager.

Payloads QE participated in GBM System Requirements Review. QE participation resulted in seven RIDs. Two HEI Quality Engineering representatives participated in the MSRR-1 CDR.

Project Assurance (PA) installed software, gathered information and developed database to assist the Shuttle Integration office on the DCASS Hours Charts.

4.4 Information Management (IM)

During the quarter, Information Management completed beta testing and deployed the Supervisor Safety Web Page (SSWP) application into production. Numerous improvements were incorporated, including suborganization assignment of multiple personnel and on-line instructions. IM also significantly altered three automated programs (crons) that had been delivered to S&MA by a third party. The revisions were necessary for accurate handling of MSFC organizations; a complete list of MSFC Organizations including contracts is now provided through SSWP. The cron changes were completed, tested and implemented in less than three weeks without code familiarity, in a language that was new to IM, and with little code documentation. IM also developed meeting and visits metrics modules. IM then launched a marketing campaign to achieve product acceptance from MSFC groups with divergent interests. IM demonstrated SSWP to the Contractor Safety Forum (CSF) twice and solicited input from CSF members by integrating them into the beta test. IM also held an Operational Readiness Review with representatives from Center Operations Information Services Department (ISD). ISD's concerns were addressed, and IM is currently working with ISD to incorporate password synchronization with Information Desktop Services (IDS). IM also demonstrated SSWP for the Area Safety Health and Environmental (SHE) Committee.

IM developed an Administration Menu for the Radar application. Four administrative functions were completed during the reporting period, and two are in process. Completion of Administrator functionality allows Radar to be maintained without the intervention of the System Administrator. Radar was also reworked to incorporate changes in S&MA organization structure and to separate historical records, resulting in improved performance. User instructions for the view and update functions were also provided.

The Inventory of Hazardous Operations (IHOPs) application was completed for review by QS30. Pending customer approval, IHOPs could be deployed in April, 2001. The facilities safety inspection database, Haztrak, was revised to allow email of reports and to accommodate unsafe acts. A new set of standard codes was developed to allow the entry of process or procedure type violations or unsafe acts. The Alerts application was beta tested and accepted as the replacement process for MSFC Alerts coordination. Numerous unique user access issues that involved coordination with system administrators throughout the MSFC community were resolved. The S&MA Organizational Issuances (OI) application was revised to email the point of contact when documents are expiring within three months. Other revisions to the OI application were put on hold by the S&MA process owner. MSFC Problem Reporting and Corrective Action (PRACA) application and As-Built Configuration and Status System (ABCSS) changes were incorporated as requested. The Certification Tracking System (Certrak) was modified to notify users of certifications that have been expired for over a year, and training classes, descriptions and links were updated. The Safety Concerns Reporting System (SCRS) table structure and screens were revised and data was imported due to changes in building responsibility.

Other major activities included selection of a new development product and completion of Information Technology (IT) security plans for S&MA's three IT General Support Systems. In completing the security plans, IM performed risk assessments of each component system,

performed risk mitigations, formulated a contingency plan, and completed waiver requests. Selection of a development product required performance of a market study and evaluation of products. The selected product has since been ordered and IM personnel are receiving necessary training.

4.5 Human Exploration and Development of Space (HEDS) Assurance

4.4.1 International Space Station (ISS) Independent Assessment

During this period, the HEDS Assurance Group Independent Assessment (IA) Team completed two ISS assessments and initiated another, provided key participation in the IA Systems, Operations, and Mission Integration Teams, participated in other ISS Program meetings and special teams, researched and updated HEDS IA risk items, and reviewed past findings for closure.

The completed assessments were "Node 2 Design Review #2," and "Ability of ISS to Recover from Element Depressurization Event." The assessment initiated was "De-orbit Propulsion Stage Propulsion Tankage Instrumentation." The final reports for the completed assessments are in process. Observations from these assessments are being documented and presented via the HEDS IA Office to the ISS Program Office for their review and attention. Additional topics have been briefed to the HEDS IA Office as potential assessments.

A number of Engineering Information Reports (EIRs) were prepared and delivered in response to emergent and short-notice requests for information by the HEDS IA Office. In addition, group personnel are assigned as Nodes 2 and 3, Interim Control Module, Multi-Purpose Logistics Module, Propulsion Module HEDS IA flight specialists.

4.4.2 Space Shuttle Independent Assessment

During this period, the HEDS Assurance Group Independent Assessment (IA) Team completed two Shuttle assessments: "Solid Rocket Booster Bolt Initiator Failure Recovery Plan," and "USA Palm Pilot Quality Surveillance Process." Final observations and recommendations from these assessments were forwarded to the appropriate program personnel. Because the Space Shuttle Program Manager has requested strong involvement by the HEDS IA organization in the Shuttle Upgrades Program, group personnel have been heavily involved in HEDS IA support and three group members appointed as points of contact for propulsion related upgrade projects are participating in their respective Integrated Product Teams. Regular reports in the form of stoplight charts and supporting information are provided to the project managers and the HEDS IA Office. An MSFC HEDS IA Team senior consultant has been assigned and participates in Shuttle Upgrades Program Management forums.

4.6 Project Assurance

HEI Product Assurance personnel provided technical support and assessments of Space Shuttle flight readiness for the following S&MA reviews:

- ET/SRB Mate Milestone Reviews (STS-100)

- Orbiter Rollout Milestone Review (STS-102)
- Pre-Flight Assessments
 - SRB (STS-102)
 - ET (STS-102)
 - RSRM (STS-102)
- Prelaunch Assessment Review (STS-102 and STS-100)
- Flight Readiness Review Tagup (STS-98 and STS-102)
- Mission Management Team Review Tagup (STS-98 and STS-102)
- Launch Support at HOSC (STS-98 and STS-102)

In addition, HEI personnel supported the Technical Issues Briefings to Art Stephenson for STS-98 and STS-102 and provided product assurance support for the ET, SRB and RSRM S&MA Assurance Offices.

In support of the Space Shuttle S&MA Integration Office, the following tasks were performed:

- Supported the Shuttle Environmental Assurance Initiative (SEA) by attending monthly telecons.
- Supported and prepared charts for the monthly Human Exploration and Development of Space (HEDS) telecon with the HEDS Enterprise Centers S&MA Directors
- Supported shuttle launch contingency simulations and debriefings in support of shuttle S&MA Integration.
- Coordinated HEI Space Shuttle manpower requirements and personnel assignments with S&MA.
- Supported and provided charts of the shuttle team leads meetings.

4.7 Risk Management

HEI instructors have taught the Continuous Risk Management (CRM) course to MSFC projects 3 times in the reporting period. The instruction includes a presentation of CRM principles the first day. The second day a workshop is held and the project personnel, with the assistance of the instructors, develop a risk baseline for the involved project.

5.0 COST REDUCTION ITEMS

Our continuing cross-utilization of employees, continuous analysis of work in progress to assure that application of resources meets the needs of the task, and the judicious acquisition and distribution of tools to enhance the efficiency of all team members allow us to minimize cost to the customer.

6.0 METRIC EVALUATION PLAN (MEP) SELF ASSESMENT – See attached metric

MEP SELF ASSESSMENT
Contract NAS8-00179
DRD No. 875MA-003
January 2001 through March 2001

1(a)	Schedule Performance	Submittal of DR's	Tabular Listing of DR's, Due Dates and Delivery Dates
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		January 2001		February 2001		March 2001	
DRD	Name	Due Date	Delivery Date	Due Date	Delivery Date	Due Date	Delivery Date
875MA-002	Financial Management Report	02/16/01	02/16/01	03/16/01	03/16/01	04/13/01	04/13/01
875MA-003	Progress Reports Quarterly	04/13/01	04/13/01	04/13/01	04/13/01	04/13/01	04/13/01
875MA-003	Progress Report Monthly	02/16/01	02/16/01	03/16/01	03/16/01	04/13/01	04/13/01
875MA-007	Quarterly Open Problem List	04/13/01	04/13/01	04/13/01	04/13/01	04/13/01	04/13/01
875MA-008	Monthly Newly Opened/Closed Problem Summary	02/16/01	02/16/01	03/16/01	03/16/01	04/13/01	04/13/01
875SA-002	Mishap and Safety Statistics Reports	02/16/01	02/16/01	03/16/01	03/16/01	04/13/01	04/13/01
875CD-001	On-Site Employee Location Listing	04/13/01	04/13/01	04/13/01	04/13/01	04/13/01	04/13/01

1(b)	Schedule Performance	Personnel Certifications	Tabular listing of personnel and corresponding Certifications and expiration dates
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See Attachment 1

875MA-009 Personnel Training and Certification for January, February, and March

c)	Schedule Performance	Safety Compliance & Haz Ops Inspections	Running schedule including completed inspections with maximum schedule defect highlighted
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See Attachment 2

Facility Inspections and Team Inspections January through March 2001

1(d)	Schedule Performance	R/T ALERT Availability	Validate compliance with 2-day requirement each month.
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ALERT 2 day on line service is not available at this time, database still in debugging process.
Statement is true from January 2001 through February 2001

March 2001:

ALERT Distribution: 14 received – all distributed within 2 work days (subject to launch freeze criteria) of initial receipt (or opening of freeze window from launch)
7397, 7398, 7398A, 7399, 7400, 7401, 7402, 7403, 7404, 7405, 7406, 7407, 7408, 7409

1(e)	Schedule Performance	Audit Action Item Status	Validate compliance with 30-day requirement each month
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No Task Directive established for this activity to date.
(No outstanding Audit Actions)

1(f)	Schedule Performance	Recurrence Control Action Request	Validate compliance with 5-day requirement each month
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**PAC RCAR Evaluation/Receipt Log
January through March 2001**

Requirement: Evaluated within 5 work days

2 Drafts	Received	Evaluated	Work Days
DR-6980	01/08/01	01/16/01	5 (MLK day Included)
QC-124	01/12/01	01/16/01	1 (MLK Day included)
DR-6959	02/15/2001	02/23/2001	5 Days (President's Day)
QC-124	02/15/2001	02/23/2001	5 Days (President's Day)
DR-6960	02/27/01	03/06/01	5 Days
DR-6961	03/09/01	03/15/01	5 Days
QSDN-125	03/22/01	03/23/01	1 Day

1(g)	Schedule Performance	Safety & Environmental Inspections	Tabular listing of supervisors, safety review date, and safety inspection date
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See Attachment 3

Safety Review and Walk Through Inspections, October 2000 – March 2001

2	Cost Performance	Negotiated Composite Direct Labor Rate (Burdened through G&A but w/o ODC's)	Contract Year to date actual performance and Recovery plan/actions
	Quarter End	(b) (4)	(b) (4)

3	Safety/Lost Time Incident Performance	LTI	Evaluation Period to date (i.e. 6months) Performance
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There was no Lost Time Incidents (LTI) reported January through March 2001.

HEI 1	Other	Contract YTD Performance	Overall Contract YTD Performance to Contract Value and projection through the current Contract Year including issues, actions and Recovery plans if appropriate.
	Total Cost Actual	Planned	
Quarter End	\$2,873,861	\$3,146,976	\$273,114 Variance

Attachment 1

Hernandez Engineering, Inc.
875MA-009
Personnel Training and Certification

Name	Title of Certification	Date Issued	Expires Date
L	Certifying Officer	10/01/2000	10/01/2010
(b) (4)	Continuous Risk Management (CRM) Course Instructor		Does Not Expire
	CRM Instructor Training		Does Not Expire
	CRM Course Instructor		Does not Expire
	CRM Instructor Training		Does not Expire
	Electrostatic Discharge Awareness for Electrical Hardware (ESD)		Does Not Expire
	Electrostatic Discharge Awareness for Electrical Hardware (ESD)		Does Not Expire
	Electrostatic Discharge Awareness for Electrical Hardware (ESD)		Does Not Expire
	Manual Move	09/28/1999	09/28/2002
	Propellant & Explosive Handler/ESD	04/21/1998	06/21/2001
	Electrostatic Discharge Awareness for Electrical Hardware (ESD)		Does Not Expire
	Propellant & Explosive Handler/ESD	08/25/1998	08/25/2001
	S&MA PCH Monitor	11/03/1999	11/03/2002
	S&MA PCH Monitor	01/31/2001	01/31/2004
	S&MA PCH Monitor	08/04/2000	08/04/2003
Examiner	Certification		Expire Date
1	Forklift Operator (Class 1)	05/02/1999	05/02/2002
	Overhead Crane/Hoist	01/06/2000	01/06/2003
	Flagman Crane Operator	01/31/2001	01/31/2004
	Aerial Lift Operator (Vertical)	05/02/1999	05/02/2002
	Forklift Operator (Class 2)	05/02/1999	05/02/2002
	Forklift Operator (Class 3)	05/02/1999	05/02/2002
	Forklift Operator (Class 4)	05/02/1999	05/02/2002
	Forklift Operator (Class 5)	05/02/1999	05/02/2002
	Forklift Operator (Class 6)	05/02/1999	05/02/2002
	Forklift Operator (Class 7)	05/02/1999	05/02/2002
	Forklift Operator (Lull Boom)	05/02/1999	05/02/2002

	Aerial Lift Operator (Boom Supported)	05/02/1999	05/02/2002
(b)(4)	Forklift Operator (Class 5)	05/02/1999	06/01/2002
	Forklift Operator (Class 2)	05/02/1999	06/01/2002
	Aerial Lift Operator (Boom Supported)	06/01/1999	06/01/2002
	Aerial Lift Operator (Bucket Truck)	06/01/1999	06/01/2002
	Aerial Lift Operator (Vertical)	06/01/1999	06/01/2002
	Forklift Operator (Class 1)	06/01/1999	06/01/2002
	Forklift Operator (Class 4)	06/01/1999	06/01/2002
	Forklift Operator (Class 6)	06/01/1999	06/01/2002
	Forklift Operator (Class 7)	06/01/1999	06/01/2002
	Forklift Operator (Lull Boom)	06/01/1999	06/01/2002
	Overhead Crane/Hoist	06/01/1999	06/02/2002
	Forklift Operator (Class 3)	06/01/1999	06/01/2002
(b)(4)	Forklift Operator (Lull Boom)	01/01/1999	01/01/2002
	Forklift Operator (Class 1)	01/01/1999	01/01/2002
	Forklift Operator (Class 2)	01/01/1999	01/01/2002
	Forklift Operator (Class 3)	01/01/1999	01/01/2002
	Forklift Operator (Class 4)	01/01/1999	01/01/2002
	Forklift Operator (Class 5)	01/01/1999	01/01/2002
	Forklift Operator (Class 6)	01/01/1999	01/01/2002
	Forklift Operator (Class 7)	01/01/1999	01/01/2002
	Flagman	01/01/1999	01/01/2002
	Overhead Crane/Hoist	01/01/1999	01/01/2002
(b)(4)	Strain Gage Inst. & Inspection	01/30/2001	01/30/2004
	Conformal Coating & Staking	01/30/2004	01/30/2004
	Crimping and Wire Wrap	01/30/2004	01/30/2004
	Cabling, Harnessing and Wiring	01/30/2004	01/30/2004
	Soldering	01/30/2004	01/30/2004

Requirement: MADR of scheduled inspections is 10 days.

TEAM INSPECTIONS	BUILDING NO.	INSPECTION DUE DATE	DATE INSPECTION
	#4481	1-15 through 2-2	January 16, 2001
	4471	1-15 through 2-2	January 16, 2001
	#4483	1-15 through 2-2	January 16, 2001
	#4487	1-15 through 2-2	January 16, 2001
FACILITY INSPECTIONS	BUILDING NO.	INSPECTION DUE DATE	DATE INSPECTION
	3789	1-15 through 2-2	January 16, 2001
	4184	1-15 through 2-2	January 16, 2001
	4185	1-15 through 2-2	January 16, 2001
	#4189	1-15 through 2-2	January 16, 2001
	4190	1-15 through 2-2	January 16, 2001
	4191	1-15 through 2-2	January 16, 2001
	4194	1-15 through 2-2	January 16, 2001
	4207	1-15 through 2-2	January 29, 2001
	4241	1-15 through 2-2	January 18, 2001
	4244	1-15 through 2-2	January 17, 2001
	4249	1-15 through 2-2	January 18, 2001
	4250	1-15 through 2-2	January 17, 2001
	4251	1-15 through 2-2	January 17, 2001
	4252	1-15 through 2-2	January 17, 2001

Requirement: MADR of scheduled inspections is 10 days.

TEAM INSPECTIONS BUILDING NO.	INSPECTION DUE DATE	DATE INSPECTION
4612	2-5 through 2-23	February 8, 2001
4605	2-5 through 2-23	February 13, 2001
4650	2-5 through 2-23	February 12, 2001
4635	2-5 through 2-23	February 7, 2001
4635-1	2-5 through 2-23	February 7, 2001
4635-2	2-5 through 2-23	February 7, 2001
4635-3	2-5 through 2-23	February 7, 2001
4635-4	2-5 through 2-23	February 7, 2001
4628	2-5 through 2-23	February 20, 2001
4640	2-5 through 2-23	February 7, 2001

FACILITY INSPECTIONS BUILDING NO.	INSPECTION DUE DATE	DATE INSPECTION
4353	2-5 through 2-23	February 5, 2001
4475	2-5 through 2-23	February 6, 2001
4476	2-5 through 2-23	February 16, 2001
4493	2-5 through 2-23	February 14, 2001
4520	2-5 through 2-23	February 20, 2001
4522	2-5 through 2-23	February 14, 2001
4523	2-5 through 2-23	February 14, 2001
4524	2-5 through 2-23	February 14, 2001
4530	2-5 through 2-23	February 16, 2001
4531	2-5 through 2-23	February 16, 2001
4539	2-5 through 2-23	February 6, 2001
4540	2-5 through 2-23	February 6, 2001
4542	2-5 through 2-23	February 6, 2001
4554	2-5 through 2-23	February 16, 2001
4559	2-5 through 2-23	February 16, 2001
4567	2-5 through 2-23	February 20, 2001
4583A	2-5 through 2-23	February 22, 2001
4583I	2-5 through 2-23	February 22, 2001
4585	2-5 through 2-23	February 22, 2001
4607	2-5 through 2-23	February 28, 2001
4620	2-5 through 2-23	February 28, 2001
4623	2-5 through 2-23	February 28, 2001
4626	2-5 through 2-23	February 22, 2001
4670	2-5 through 2-23	February 22, 2001
4671	2-5 through 2-23	February 22, 2001
4699	2-5 through 2-23	February 22, 2001
4636	2-5 through 2-23	February 28, 2001
4639	2-5 through 2-23	February 28, 2001

Requirement: MADR of scheduled inspections is 10 days.

TEAM INSPECTIONS BUILDING NO.	INSPECTION DUE DATE	DATE INSPECTION
4705	2-26 through 3-23	February 27, 2001
4711	2-26 through 3-23	March 15, 2001
4707	2-26 through 3-23	March 13, 2003
4754	2-26 through 3-23	March 20, 2001
4755	2-26 through 3-23	March 20, 2001
4760	2-26 through 3-23	March 26, 2001

FACILITY INSPECTIONIS BUILDING NO.	INSPECTION DUE DATE	DATE INSPECTION
4641	2-26 through 3-23	February 26, 2001
4642	2-26 through 3-23	February 26, 2001
4643	2-26 through 3-23	February 26, 2001
4647	2-26 through 3-23	February 26, 2001
4648	2-26 through 3-23	February 26, 2001
4655	2-26 through 3-23	March 2, 2001
4656	2-26 through 3-23	March 6, 2001
4657	2-26 through 3-23	March 6, 2001
4659	2-26 through 3-23	March 6, 2001
4693	2-26 through 3-23	February 22, 2001
4733	2-26 through 3-23	February 22, 2001
4734	2-26 through 3-23	February 22, 2001
4735	2-26 through 3-23	February 22, 2001
4736	2-26 through 3-23	February 22, 2001
4739	2-26 through 3-23	February 22, 2001
4744	2-26 through 3-23	February 22, 2001
4759	2-26 through 3-23	February 22, 2001
4761	2-26 through 3-23	February 22, 2001
4775	2-26 through 3-23	February 22, 2001
4776	2-26 through 3-23	February 22, 2001
4777	2-26 through 3-23	February 22, 2001

